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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/226,418	01/06/1999	AHMED A. HASSAN	107650	1101

7590 03/24/2004

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EXAMINER

VERDIER, CHRISTOPHER M

ART UNIT	PAPER NUMBER
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3745

DATE MAILED: 03/24/2004

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/226,418

Applicant(s)

HASSAN ET AL.

Examiner

Christopher Verdier

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 February 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,7-10,12,13 and 20-23 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 20-23 is/are allowed.
- 6) ☒ Claim(s) 1,7-8, 10,12 and 13 is/are rejected.
- 7) ☒ Claim(s) 9 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

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Applicant's Amendment dated February 5, 2004 has been carefully considered but is deemed non-persuasive. Claims 1, 7-10, 12-13, and 20-23 are pending.

Applicants have amended independent claim 1 to recite that all of the plurality of apertures are disposed closer to the trailing edge than the leading edge, and have argued that this limitation defines over Glezer 5,758,823, because figures 6A and 6B of Glezer show that the aperture 16 is closer to the leading edge than the proximal edge, and that there is no teaching in the prior art that would teach locating the apertures of Glezer to a position nearer the trailing edge, other than Applicant's specification. The examiner agrees with Applicants that in Glezer, the aperture 16 is closer to the leading edge than the proximal edge. However, it is conventional and well-known in the art to locate the blowing apertures of an airfoil adjacent to the trailing edge for the purpose of controlling aerodynamic properties of the airfoil, such as the aerodynamic forces, moments, and lift characteristics. Dancila 5,791,601 teaches such a feature. Applicants' arguments on page 6, last paragraph that bridge the first paragraph of page 7 as to why it is advantageous to locate the apertures proximal to the trailing edge are noted, and Applicants have stated that in the instant application, all of the apertures should be located along a distance comprising 5-8 percent of the airfoil from the trailing edge. Applicants have argued that because Glezer discloses a synthetic jet actuator for a different purpose than the present invention, namely to interact with and change the free stream flow of fluid across the airfoil, the issue of force application is not present in Glezer and there is no need to locate the apertures nearer to the trailing edge. These arguments are not persuasive, because Dancila (see column 6, lines 20-22) teaches that plural small holes or a series of slots 13 may be located along an airfoil

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12 close to the trailing edge 14, for the purpose of controlling aerodynamic properties of the airfoil, such as the aerodynamic forces, moments, and lift characteristics. Column 6, lines 16-22 of Dancila recognize that the slot/hole location dramatically affects the flow around the blade and thus its lift characteristics, and teaches that the blowing slot/hole may be located at virtually any location on the rotor blade surface. MPEP 2144 states that the reason or motivation to modify a reference may often suggest what the inventor has done, but for a different purpose or to solve a different problem, and that it is not necessary that the prior art suggest the combination to achieve the same advantage or result discovered by applicant. *In re Linter*, 458 F.2d 1013, 173 USPQ 560 (CCPA 1972); *In re Dillon*, 919 F.2d 688, 16 USPQ2d 1897 (Fed. Cir. 1990), cert. denied, 500 U.S. 904 (1991).

With regard to independent claim 12, Applicants have amended claim 12 to recite that the at least one aperture is disposed along the aerodynamic surface at a distance not greater than 8 percent of the chord length from the trailing edge, and that no apertures are disposed along any other portion of the chord length, and have argued that these added limitations define over Soviet Union Patent 1,761,973, for the reasons set forth above. The examiner agrees with Applicants that amended claim 12 defines over the Soviet Union Patent. However, Dancila 5,791,601, as discussed above, teaches that the plural small holes or a series of slots 13 may be located along an airfoil 12 close to the trailing edge 14, specifically at a location of less than one-half chord distance from the trailing edge 14. Because a location of less than one-half chord distance from the trailing edge includes a distance not greater than 8 percent of the chord length from the

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trailing edge, the combined teachings of Glezer and Dancila render claim 12 unpatentable for the reasons set forth below.

Terminal Disclaimer

The terminal disclaimer filed on February 5, 2004 disclaiming the terminal portion of any patent granted on this application which would extend beyond the expiration date of U.S. Patent 6,543,719 has been reviewed and is accepted. The terminal disclaimer has been recorded.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

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Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Glezer 5,758,823 in view of Dancila 5,758,823. Glezer (figures 1A-1C and 6A-6B) discloses an active control device for improving airflow characteristics in the vicinity of airfoil 91 having an outer aerodynamic surface 92 and an unnumbered interior volume (corresponding to "14" in figures 1A-1C), with an inherent chord of predetermined length, an unnumbered leading edge to the left in figures 6A-6B and an unnumbered trailing edge to the right in figures 6A-6B, plural apertures 10 on the outer aerodynamic surface, communicating the outer aerodynamic surface to the interior volume, an unnumbered chamber inherently disposed within the interior volume, defining a volume in fluid communication with the apertures, plural diaphragms 18 that define a wall of the chamber, which are movable from a first position to a second position to push air through the apertures and out of the interior volume of the aerodynamic structure, and which are movable from the second position to the first position to draw air through the apertures and into the interior volume, with the drawing and pushing steps being performed by the diaphragms. Note controller 24 coupled to the plural diaphragms. Glezer (column 7, lines 36-43 and referring to the aerodynamic body of figure 6) states that arrays of jet actuators may be placed along the leading and trailing edges and along the upper and lower surfaces of the airfoil. This results in the total number of apertures corresponding to the total number of diaphragms, because each aperture has its own diaphragm. However, Glezer does not disclose that all of the plurality of apertures are closer to the trailing edge than to the leading edge.

Dancila 5,758,823 (figures 1-2 and column 6, lines 1-22) shows an airfoil 12 having plural blowing apertures 13 in the form of either plural small holes or a series of slots disposed at

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a distance closer to a trailing edge 14 than a leading edge, specifically at a location of less than one-half chord distance from the trailing edge 14, for the purpose of controlling aerodynamic properties of the airfoil, such as the aerodynamic forces, moments, and lift characteristics.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to form the airfoil of Glezer such that all of the plurality of apertures are closer to the trailing edge than to the leading edge, as taught by Dancila, for the purpose of controlling aerodynamic properties of the airfoil, such as the aerodynamic forces, moments, and lift characteristics.

Claims 7-8, 10, and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Glezer 5,758,823 and Dancila 5,791,601 as applied to claim 1 above, and further in view of view of O'Neil 5,806,808. The modified active control device of Glezer shows all of the claimed subject matter except for first and second sensors operatively coupled to the controller which are disposed on the aerodynamic surface and which measure a flow characteristic of air proximal the first and second sensors, with the controller regulating the oscillation frequency of at least one diaphragm in response to the flow characteristic, with the first and second sensors comprising pressure transducers, and being disposed proximal the leading edge.

O'Neil (figures 4-5) shows active control device having first and second sensors near 4, 5 operatively coupled to a controller which are disposed on an aerodynamic surface of an airfoil and which measure a flow characteristic of air proximal the first and second sensors, with the

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controller regulating the oscillation frequency of at least one diaphragm 13 in response to the flow characteristic, with the first and second sensors comprising pressure transducers, and being disposed proximal the leading edge, for the purpose of managing lift and reducing noise.

It would have been further obvious at the time the invention was made to a person having ordinary skill in the art to provide the modified active control device of Glezer with first and second sensors operatively coupled to the controller which are disposed on the aerodynamic surface and which measure a flow characteristic of air proximal the first and second sensors, with the controller regulating the oscillation frequency of at least one diaphragm in response to the flow characteristic, with the first and second sensors comprising pressure transducers, and being disposed proximal the leading edge, as taught by O'Neil for the purpose of managing lift and reducing noise.

Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Glezer 5,758,283 in view of Dancila 5,791,601. Glezer (figures 1A-1C and 6A-6B) discloses an active control device for improving airflow characteristics in the vicinity of airfoil 91 having an outer aerodynamic surface 92 and an unnumbered interior volume (corresponding to "14" in figures 1A-1C), with an inherent chord of predetermined length, an unnumbered leading edge to the left in figures 6A-6B and an unnumbered trailing edge to the right in figures 6A-6B, plural apertures 10 on the outer aerodynamic surface, communicating the outer aerodynamic surface to the interior volume, an unnumbered chamber inherently disposed within the interior volume, defining a volume in fluid communication with the apertures, plural diaphragms 18 that define a

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wall of the chamber, which are movable from a first position to a second position to push air through the apertures and out of the interior volume of the aerodynamic structure, and which are movable from the second position to the first position to draw air through the apertures and into the interior volume, with the drawing and pushing steps being performed by the diaphragms.

Note controller 24 coupled to the plural diaphragms. Glezer (column 7, lines 36-43 and referring to the aerodynamic body of figure 6) states that arrays of jet actuators may be placed along the leading and trailing edges and along the upper and lower surfaces of the airfoil. This results in the total number of apertures corresponding to the total number of diaphragms, because each aperture has its own diaphragm. However, Glezer does not disclose that all of the at least one aperture is disposed along the aerodynamic surface a distance of no greater than 8 percent of the chord length from the trailing edge, with no apertures being disposed along any other portion of the chord length.

Dancila 5,758,823 (figures 1-2 and column 6, lines 1-22) shows an airfoil 12 having plural blowing apertures 13 in the form of either plural small holes or a series of slots disposed at a distance closer to a trailing edge 14 than a leading edge, specifically at a location of less than one-half chord distance from the trailing edge 14, for the purpose of controlling aerodynamic properties of the airfoil, such as the aerodynamic forces, moments, and lift characteristics. The location of less than one-half chord distance from the trailing edge would inherently include a distance not greater than 8 percent of the chord length from the trailing edge,

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It would have been obvious at the time the invention was made to a person having ordinary skill in the art to form the airfoil of Glezer such that all of the plurality of apertures are closer to the trailing edge than to the leading edge, and such that the at least one aperture is disposed along the aerodynamic surface a distance of no greater than 8 percent of the chord length from the trailing edge, with no apertures being disposed along any other portion of the chord length, as taught by Dancila, for the purpose of controlling aerodynamic properties of the airfoil, such as the aerodynamic forces, moments, and lift characteristics.

Allowable Subject Matter

Claims 20-23 are allowed.

Claim 9 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after

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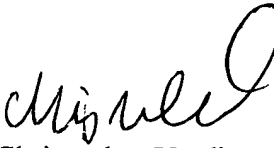
the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher Verdier whose telephone number is (703)-308-2638. The examiner can normally be reached on Monday-Friday from 10:00-6:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward K. Look can be reached on (703) 308-1044. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

C.V.
March 17, 2004


Christopher Verdier
Primary Examiner
Art Unit 3745